PRINCE GEORGE FOREST DISTRICT

TOURISM OPPORTUNITIES ANALYSIS

Prepared For:
Prince George
Land And Resource Management Plan (LRMP)

Prepared By:
Roger Beardmore & Dave Kaegi
Future Legacy Consulting Group
Box 161
Revelstroke, B.C. V0E 2S0

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RMB & DAK

EXECUTIVE SUMMARY

To help foster the sought-for balance between the economic value provided by natural resource development and the outdoor experiences and values inherent in the natural environment, the Interagency Planning Team of the Prince George Land and Resource Management Plan initiated a Forest Recreation and Tourism Opportunities Study (FRTOS) for the Prince George Forest District.

This study includes updated recreation and tourism resource inventories, and identifies and maps terrain capability for selected tourism and recreation products. This will allow the Ministry of Forests, BC Assets and Lands Corporation, BC Parks, and the Ministry of Small Business, Tourism and Culture to support local agencies, First Nations and community groups as they seek to develop forest recreation and tourism business opportunities, diversify local economies, maintain access to recreation resources for local residents, and minimize conflicts among resource users.

The study area, as defined for this project, encompasses the entire Prince George Forest District, the Kakwa Recreation Area and a small adjacent parcel next to the Alberta border. The area covers over 3.4 million hectares and is centred around the city of Prince George. The terrain of the district varies from dry, rolling range country in the southwest to the deep valleys and steep, rugged Cariboo Mountains and Rocky Mountains in the east and north. The many lakes, rivers and mountains provide superlative opportunities for a wide variety of outdoor recreation and tourism opportunities, both in summer and in winter.

Tourism accounts for 9% of basic sector jobs and due to the significant resource base for recreation and tourism, there is considerable potential for further development of commercial tourism.

This study will have application in the ongoing Prince George Land and Resource Management Planning process, to help define current and potential future resource values to the tourism and recreation resources sectors, and to enable better operational management of tourism and recreation resources. In addition, sound resource inventories and evaluation of potential commercial recreation opportunities will support integrated resource and community planning targeted toward economic, social and environmental sustainability and ultimately provide a future legacy for district residents.

Heli-Skiing / Cat-skiing

The eastern and southeastern portions of the district have the majority of the areas with capability for heli-skiing. Of particular note, glacier areas and high elevation northerly aspects stand out as having high capability. The capability for this activity generally tapers off from south to north along the Rocky Mountains throughout the district.

Ski Touring

The eastern mountainous portion of the district is the area that presents the greatest capability for ski touring. Generally speaking, high elevation, north-facing terrain tends to comprise the areas of high capability, while southerly aspects tend to possess moderate to low capability.

Nordic Skiing

The western half of the district, and in particular the southwest portion, with its associated lower elevations and relief, is where the predominance of nordic ski capability occurs. This area offers the best choices for nordic skiing development. A high proportion of all terrain that has nordic skiing capability falls within the high and moderate categories, suggesting that the appropriate terrain characteristics are widespread in the western part of the district.

Snowmobiling

The eastern mountainous portion of the district contains almost all of the high capability terrain for snowmobiling. It is noteworthy, however, that extremely steep slopes border much of this terrain and may negate access or make it extremely difficult. In the flatter western portions of the district, there are almost limitless snowmobiling opportunities but these are identified as having low capability (due to the alpine focus of the model), with some moderate capability along selected trails.

Heli-Hiking

Overall, the district has abundant potential to support heli-hiking. The high capability areas for heli-hiking are in the east and northeast portion of the district, in the heights of land and ridges surrounding the McGregor, Herrick and Torpy River drainages trending NW/SE along the continental divide. Much of the high alpine areas that have high capability for heli-hiking also have high capability for Llama packing/backpacking and horse packing. This could lead to conflicts amongst mechanized versus non-mechanized users.

Horse-Packing

Due to the vast network of logging roads and trails in the district, horse packing is possible almost anywhere. However, in terms of wilderness-oriented multi-day horse packing opportunities, a number of areas do stand out.

Llama Packing / Backpacking

The entire mountainous eastern portion of the district possesses areas of high capability for Llama packing / backpacking. The areas on either side of the Highway 16 corridor, are the easiest to access. Scattered elsewhere throughout the district, there are a number of trails of moderate to low capability (Note: at the 1:250,000 scale, these trails are difficult to discern). There is little distinction possible between the high capability areas. The following general areas provide some context for discussion.

Lake Paddling

In general, there is not a great abundance of high quality, multi-day lake paddling opportunities in the Prince George District. There are few large lakes, and those that exist are located in the lower elevation portions in the north west of the district. There are no significant lake paddling opportunities in the scenic mountainous portion of the district.

ATV'ing

ATV'ing is possible throughout the district except in the mountainous portions of the northeast. This is largely due to the large number of logged areas and the associated logging roads that provide the main attribute for this activity. The southern portion of the district in particular has a vast network of roads and trails that have ATV capability. Since this is largely a day-use activity, access to long distance trails and remote wilderness is not a priority.

Jet-Boating

Overall, the district has a moderate potential for jet boating. There are some rivers with moderate capability that have sections of high capability such as the Parsnip River and the Herrick River. Other rivers with sections of moderate capability include the Torpy River, Nechako River, the Fraser River between Red Rock and Hixon, and the Crooked River.

The analysis of the capability maps developed in this study may have relevance when comparing activities at the landscape level scale (1:250,000). When viewed from the district perspective, this report and associated maps can be a useful tool to identify and market as yet untapped commercial recreation opportunities and to delineate and separate potential conflicts amongst often divergent recreational users groups. At the 1:50,000 scale, however, the maps should be used with a clear understanding of modelling limitations and in conjunction with other sources of information to help identify site specific opportunities.

1 INTRODUCTION

1.1 Background

The residents of the Prince George Land and Resource Management Plan (LRMP) planning area value the economic opportunities that are provided by natural resource development – particularly forestry. They also value the outdoor experiences and values that are inherent in the natural environment within the planning area. There is recognition that the long term survival of their communities depends on maintaining a balance amongst what often appear to be competing interests.

The LRMP is intended to provide greater economic stability for residents and communities within the planning area and ensure that environmental values and resources are sustained over the long term. To help foster the sought-for balance, the Interagency Planning Team of the Prince George Land and Resource Management Plan initiated a Forest Recreation and Tourism Opportunities Study (FRTOS) for the Prince George Forest District.

This study includes updated recreation and tourism resource inventories, and identifies and maps terrain capability for selected tourism and recreation products. This will allow the Ministry of Forests, BC Lands, BC Parks, and the Ministry of Small Business, Tourism and Culture to support local agencies, First Nations and community groups as they seek to develop forest recreation and tourism business opportunities, diversify local economies, maintain access to recreation resources for local residents, and minimize conflicts among resource users.

This study will have application in the ongoing Prince George Land and Resource Management Planning process, to help define current and potential future resource values to the tourism and recreation resources sectors, and to enable better operational management of tourism and recreation resources. In addition, sound resource inventories and evaluation of potential commercial recreation opportunities will support integrated resource and community planning targeted toward economic, social and environmental sustainability and ultimately provide a future legacy for district residents.

1.2 Study Purpose

The purpose of this study was to conduct a Forest Recreation and Tourism Opportunities Study (FRTOS) for the Prince George Forest District. This study enhances existing forest recreation inventory (FRI) and tourism resource inventory (TRI) data, maps capability for specified tourism and recreation activities, and specifies opportunities for commercial recreation and tourism development. This project will also provide information that may be used to support appropriate, sustainable recreation and tourism development and contribute to integrated resource planning in the study area.

1.3 Project Scope

The project was initially intended, in part, to update and expand existing FRI/TRI data for the study area. Since two very recent studies had already largely accomplished this, it was determined by the project Steering Committee that the emphasis should be on modelling capability rather than on updating inventory. Notwithstanding, the study does include some new data on operating areas

gathered from discussions with current operators in the Prince George District. The study then models terrain capability for 10 selected tourism products/activities, and then identifies new or expanded opportunities for commercial recreation and any constraints that may limit such opportunities.

1.4 The Study Area

The study area, as defined for this project, encompasses the entire Prince George Forest District, the Kakwa Recreation Area and a small adjacent parcel next to the Alberta border. The area covers over 3.4 million hectares and is centred around the city of Prince George. The terrain of the district varies from dry, rolling range country in the southwest to the deep valleys and steep, rugged Cariboo Mountains and Rocky Mountains in the east and north. The many lakes, rivers and mountains provide superlative opportunities for a wide variety of outdoor recreation and tourism opportunities, both in summer and in winter.

The Prince George LRMP area has a population of 83,259 (1991), with the vast majority residing in the City of Prince George (75,065). The population of the area increased by 1% between 1986 and 1991, with growth in the City of Prince George offsetting declines elsewhere within the area. Although the Prince George economy has been diversifying in recent years, forestry still dominates with 32% of basic sector employment. Prince George is a northern transportation hub, with the intersection of Highways 16 and 97, and the British Columbia Railway and Canadian National Railway passing through the city. A national airport also serves Prince George. Ranching is a mainstay of the southern part of the district.

Agriculture accounts for 3% of total basic sector jobs and mining accounts for a further 4%. Tourism accounts for 9% of basic sector jobs and due to the significant resource base for recreation and tourism, there is considerable potential for further development of commercial tourism.

2 METHODOLOGY

2.1 Project Methodology

As the initial step, we collected and conducted a thorough review of background materials, reports, maps, data (paper or digital), or other useful information from BC Government, Regional District staff, and other pertinent sources. In particular, we paid close attention to recent studies such as the Prince George Region Tourism Opportunity Analysis being conducted by the Prince George Region Development Corporation, and the Strategic Recreation Use Plan for the Omineca-Peace Recreation Supply Area conducted by the Prince George Recreation Steering committee (MOF and MELP Recreation Specialists).

2.2 Digital Data Collection

Existing digital data was collected from a number of sources and imported to create a working base map.

TRIM 1:20000 - Planimetry files were loaded using existing TRIM to ARC software, raw contour and dem files were translated in the same manner. This information made up the base for the source maps. Other digital data sets included: recreation quad base mapping for the district; recreation features (FRI); recreation opportunities spectrum; strategic recreation plan (DLC Consulting Ltd., Omineca-Peace Recreation Supply study); Prince George Tourism Opportunities Study (Economic Planing Group); Tourism Resource Inventory (TRI); parks and protected areas; and Visual Sensitivity Index (VSI).

2.3 Identification of Operators/User Groups – Data Assembly

Future Legacy Consulting Group identified all existing tourism operations and significant recreational user groups in the region. In consultation with the Steering Committee, and with representatives of the industry and user groups, we identified specific location, resource and operational attributes, as well as spatial extent of these users. This was accomplished by conducting a series of workshops with operators and users, as well as telephone interviews where required. Data collection was performed using 1:250,000 scale hard copy maps.

2.4 Digital Data Conversion

Future Legacy Consulting Group then assembled the information discussed above in digital files that are consistent with the Province's GIS standards. Hard copy maps were digitized, edited and checked. Files contain maps in ARC/INFO export format, with linked database and spatial (map) data tied to the provincial TRIM 1:20,000 base, including points defining the location of existing tourism and recreation facilities, lines indicating travel routes and linear features such as trails, and polygons indicating areas used by tourism operators and recreationists, along with polygon files indicating potential development areas classified according to their capability.

The data generated through discussion with tour operators and user groups was digitized from the TRIM based source maps, cleaned and built with the appropriate topology.

2.5 Modelling

Using attributes developed in discussion with tour operators and user groups, Future Legacy Consulting Group developed 10 separate product models, and applied the use and resource data to generate analyses of the capability of the study area to support the defined tourism/recreation products and activities. A series of map layers were produced that indicate "High", "Medium"' and "Low" capability for each product/activity. Test plots were printed at the 1:250,000 and 1:50,000 scale and these outputs were verified in a second round of workshops with operators and users.

2.6 Conflict/Constraint Identification

Many areas may display the biophysical capability to support a particular tourism product or activity. However, unless that capability can be combined with minimal conflict with other uses, these areas may not be suitable for commercial development. Constraints to the development of opportunities were identified in consultation with user groups, operators, and agencies. Factors that affect options for commercial recreation development include: land status and tenure; provincial policies concerning commercial use; other resource values (e.g. wildlife, forestry); local resident (private) recreation use, and other forms of commercial recreation use.

2.7 Project Reports and Deliverables

Future Legacy Consulting Group prepared a preliminary report which summarized the capability and opportunities for tourism/recreation development, and indicated where such opportunities may lead to conflicts with other resource users, and what constraints might prevent the development of those opportunities.

The preliminary report was revised to incorporate comments from the Steering

Committee, and a final report was submitted to the IPT. The final report contains:

- map capability with explanatory notes on the methodology used to collect and display the data;
- modelling information, including explanatory notes on the methods and source data used;
- a discussion of model attributes and associated limitations along with identification of potential model improvements for future consideration;
- identification of constraints and suitability factors that should be considered when evaluating the potential of commercial recreation opportunities;
- a discussion of candidate areas for product/activity development, including a general discussion of each area indicating its key resource features, potential for conflict with other resource users, and constraints which may inhibit development;

This report was prepared in Microsoft Word 97. Two camera-ready originals of the report are provided, (one bound and the other unbound) as well as digital files in ARC/INFO export format, at 1:20,000; 1:50,000 and 1:250,000 scale in BC Albers projection on a NAD83 datum, including files for:

- 10 Capability Models at the 1:50,000 and 1: 250,000 scales.
- 6 slope coverages and 1 aspect coverage for selected models;
- Appropriate TRIM files translated to ARC/INFO;
- All other data used that was not previously translated into ARC/INFO such as MoF recreation features, and selected data from the Hall* and Leavers* reports;

Note: Hall* and Leavers* reports refer to studies identified in Appendix 1: References #2 and #1 respectively.

3 INTERMEDIATE ANALYSIS

For some tourism products or activities, it was necessary to develop intermediate map coverages to insert into the models. Because these coverages often apply to several models, they are described in this section rather than being included with each of the capability models.

3.1 Biogeoclimatic Zones

Four major biogeoclimatic zones exist within the study area, each with several sub-zones and variants. These are the Alpine Tundra (AT), Englemann Spruce- Subalpine Fir (ESSF), Interior Cedar-hemlock (ICH) and Sub-boreal Spruce (SBS) zones.

Biogeographic units are the result of zonal (climatic) classification and they represent groups of ecosystems under the influence of the same regional climate. Zones are named after one or more of the dominant climax species in zonal ecosystems and a geographic or climatic modifier. Zones are large geographic areas with a broadly similar type of climate. Each biogeoclimatic sub-zone has a distinct climax (or near-climax) plant association, which is thought to best reflect the regional climatic conditions of the sub-zone. Sub-zone names are derived from classes of relative precipitation and temperature.

The approach taken was to interpret information about each zone and/or sub-zone for its capability to support identified tourism products. Using the *Field Guides for Identification and Interpretation of Ecosystems* in the Prince George Forest Region, we selected the sub-zones and their variants that contained the most desirable characteristics for each tourism product.

Alpine Tundra:

The Alpine Tundra (AT) occurs above the tree line at elevations usually exceeding 1500 metres. Snow can fall in any month of the year, and snowpack is typically 2 to 3 metres, or more in some locations, and can persist for 9 or 10 months.

Englemann Spruce-Subalpine Fir (wk,wc)

The ESSFwk occurs at subalpine elevations (1070-1350 m) from the highland between the Fraser and Willow Rivers east towards McBride. Being situated at high elevations, it is cold and one of the wettest subzones in the district. Much of the precipitation falls as snow. The ESSFwc occurs at even higher elevations (1300-1550 m) and is therefore colder and has a more persistent snowpack. Forests in this sub-zone tend to be widely spaced and clumpy. These forests tend to become even more widely spaced as they increase in elevation, with parkland conditions merging into the alpine zone.

3.1.1 Interior Cedar-Hemlock

The ICH occurs at medium elevations in the valleys of the Fraser River (from around Dome Creek to the Sinclair Mills area), the Torpy River and West Torpy River, portions of the upper McGregor River, and Slim Creek, and on the slopes around Sugarbowl Mountain and near Purden Lake. The ICH forests are primarily mature – old growth western red cedar and western hemlock, with some white spruce and Douglas fir. Understories are usually thick with a high incidence of devil's club.

3.1.2 Sub-Boreal Spruce

The SBS is generally drier and warmer than other biogeoclimatic units in the district. This is a reflection of its relatively low elevation. Sub-zones and variants of this unit occupy the entire western portion of the district. Winter precipitation is relatively lower than other zones in the district with winter accumulations of 1-2 metres. Much of this zone has been logged and there is and extensive network of logging roads and trails.

3.2 Slope

Slope is a critical ingredient for the winter activity (e.g. skiing and snowmobiling) models, and is also an important consideration in several summer models (such as heli-hiking, horse-packing and Llama packing/backpacking). It is calculated using digital elevation model (dem) points and breaklines from the TRIM files. A triangulated irregular network (TIN) was generated, and then a 100 metre lattice was selected and used to generate polygons with slope values specific to each model.

3.3 Relief

Relief is an important component of the winter activity models, particularly the skiing models. Relief was calculated by writing a program that selects the contour coverage and determining the vertical distance (elevation) between the highest and lowest contour lines associated with a resultant polygon from the unioning of all other coverages in a model. This value is placed in each polygon and then the model selects those with the required relief values.

3.4 Roads and Trails

Roads and trails are an important attribute in some models including the horse packing, and ATV models. Roads and trails are derived from the TRI planimetry data files, and trail data is also derived from the PG Tourism Opportunity Study. Roads and trails were grouped into three classes: double-lane gravel; single-lane gravel; and trail. 100 metre buffers were added to create polygons.

For many tourism products and activities, access is very important. Though necessary, existing road and trail networks are not a measure of the landscape's true capability for a given tourism product (except in the case of the ATV and horse-packing models, where gravel roads and trails are a primary attribute). Therefore, existing roads are provided as a separate coverage and are included with the final capability maps.

3.5 Features

Since specific features can significantly enhance the capability of an area to support tourism products/activities, features were used to enhance most of the capability models.

Feature information was derived from the MOF recreation features inventory that has the most detailed and complete recreation features data for the district. An attempt was made to use the TRI "scenic" attributes and other features, however, the information was averaged over large generalized landscape units, and provided poor results. Features are generally rated equally in terms of importance in the models, as differential weighting is highly subjective. However, where there was

an extremely important feature for a given product, it was given a higher point rating (e.g. AT/ESSFw feature in the horse packing model).

4 CAPABILITY MODELLING

Capability, simply stated, is the ability of the natural and cultural resources of an area to support a given tourism product or recreation activity. Through the analysis of natural resources and features, cultural or human resources, and existing uses, capability map layers were generated using attributes determined to be critical to the success of a given product.

The attributes were selected in consultation with tour operators and recreational user groups who are intimately familiar with the both their chosen activity and the resources of the Prince George District. Suitability factors were not a consideration in the modelling process. Areas that may have a high capability to support a particular product or activity, may not ultimately be suitable for that activity to take place. For example, snowmobiling may have high potential in an area, but if that area is already tenured for heli-skiing, the potential for conflict is high - as these are generally incompatible uses.

Model Selection

The decision to model the tourism products/activities in this study was made by the project Steering Committee, based on their knowledge of the district and their understanding of which products offer the greatest potential for tourism and commercial recreation development.

4.1 Heli-Skiing / Cat-skiing

Product Description:

Heli-Skiing is alpine (downhill) style skiing in remote mountainous terrain utilizing helicopters as the means of transportation to the top of the runs. Cat-skiing is similar, except snow-cats (caterpillar-tracked over-snow vehicles) are used as the mode of transportation. Participants are looking for untracked powder snow and long uninterrupted runs. Downhill (alpine) ski gear and techniques are used to ski "steep and deep" terrain. Typically, advanced levels of skiing ability and fitness were required to participate, but with the advent of wide ("fat") skis, the sport is now accessible to a much wider range of abilities and fitness levels.

With heli-skiing, two types of product are offered. The majority seek week-long packages based from comfortable lodge-style accommodations. The combination of helicopters and high-end accommodation makes this an expensive activity, catering primarily to an affluent international clientele. Day-use heli-skiing operations offer a lower cost alternative since accommodations are not required. Seats are often sold as "fill-ins" if week-long packages are not sold-out. As with heli-skiing, cat-skiing offers both day and week-long packages, but due to the slower mode of transport, less vertical skiing is possible during a given period, and overall, the product is less expensive than heli-skiing.

Model Attributes:

The primary attribute for this product is the "alpine" setting (AT), and the associated long runs with deep snow. However, it is also necessary for operators to have a sufficient proportion of treed runs as poor weather and visibility often preclude using exclusively the treeless alpine slopes. The upper

portions of the Englemann Spruce – Subalpine Fir (ESSFwc/wk) zone that are gladed (widely spaced trees) are also used extensively and add a desirable variation to treeless alpine bowls and slopes.

Northern and northeastern aspects are preferred as the sun-effect (crusting) is minimized and the snow is more consistent and typically drier, affording a higher probability of a "deep powder" experience and a lower probability of sun-induced avalanches. This is especially important toward the latter part of the season.

Unbroken slopes that are within the 20-45 degree range are the necessary prerequisites for both heli and cat-skiing. Forty-five degrees is the approximate upper limit of skiing while maintaining reasonable avalanche safety, although this is highly variable depending on local conditions, and precautions must be taken on any slope. Twenty degrees is the lower limit of prime skiing terrain.

Both heli and cat-skiing require unbroken runs with a vertical relief of several hundred metres. Ideal conditions require 400 metres for cat-skiing and 800 metres for heli-skiing.

The model averages these for simplicity, but this figure could easily be adjusted when looking for a specific product in a specific area.

The presence of glaciers was identified as being the only "feature" that would have any significance for the model. This would add advanced terrain that would serve as an attractant or selling point for operators. It also ensures that glaciated alpine terrain is picked up in the model, as the alpine tundra zone excludes glaciated areas in the TRIM data base.

Model Limitations:

There are no significant limitations in this model. Potentially, the model might identify terrain in the ESSF/ICH as high (or moderate) capability if it met all the desired attributes.

However, if the terrain were heavily treed, it would likely not be usable unless there were open areas such as avalanche paths. The model automatically selects glaciers as having high capability for heli-skiing and cat skiing. This may or may not be the case as the glacier may be too small, too steep, or have too many crevasses to be safe.

One caveat of the model is that heli-skiing requires very large territories, and a high proportion of high and moderate capability terrain would be required within a geographic area of at least 1000 sq. km.

Potential Model Improvements:

More detailed local weather data, especially wind and precipitation data, could enhance the model. A more detailed glacier inventory and better scenery data would also be useful in refining this model.

4.2 Ski Touring

Product Description:

Ski touring is a backcountry skiing activity that utilizes either specialized mountaineering or telemark ski equipment. Participants typically are physically fit, with at least intermediate to advanced skiing abilities, as this form of skiing is demanding. They undertake ski touring on a day-use or multi-day basis. With multi-day trips, participants stay in tents or snow-caves, or in backcountry cabins.

Commercial operations are almost exclusively based from wilderness cabins. Most operators focus on "powder skiing" similar to the heli and cat skiing operators, although there is usually an added component of travel over variable scenic terrain as part of the experience. The significant difference is the exclusive reliance on self-propelled transportation. The top of the runs are gained by attaching "skins" to the bottom of the skis and literally hiking on the snow. There is also a greater premium placed on pristine wilderness and lack of motorized vehicles.

Model Attributes:

As with the heli and cat-skiing model, the alpine (AT) and upper ESSF biogeographic zones with their associated deep snow conditions are the principal attractant and primary screen in the model. Lower ESSF and ICH zones are also important attributes for tree skiing in inclement weather and to provide variety and safe terrain (protection from avalanches) for the participant. The Sub-Boreal Spruce Zone (SBS) is deemed to have no capability for this type of ski touring, as it correlates to lower elevations and lesser amounts of snowfall.

Slopes should be between 15 and 45 degrees and relief must be at least 200 metres to provide long enough slopes for the participants to enjoy some of the fruits of their labour.

As with other skiing models, a high proportion of northern aspects is required to maximize the preferred snow conditions and minimize negative sun affects.

As with the heli-skiing and cat-skiing models, glaciers are added as features to ensure that they are captured in the model.

Model Limitations:

The model has no significant limitations, other than the fact that all of the desired attributes of the model must be captured within a geographic area of 70-100 square kilometres, in order to have a viable commercial operation. The model also identifies glaciers as being automatically of high capability for ski touring. The glacier may or may not have capability, depending upon its particular configuration (e.g. too small, too steep, too many crevasses), but this data is unavailable. Slopes that are less than 15° are still suitable for ski touring, but they are seen as the lower limit of prime "turning" terrain which is the focus of this model.

Potential Model Improvements:

Views of highly modified terrain, such as clear cuts, are less desirable – but are not captured in the model. This information is available in the TRI data, but is considered unreliable as it is averaged over large landscape units at the 1:250,000 scale. The information results in unrepresentative polygons when applied at the 1:50,000 scale. If reliable "scenery" information was available, it would greatly enhance the model. Better local weather data and a detailed glacier inventory would also be an asset.

4.3 Nordic Skiing

Product Description:

Nordic Skiing, for the purposes of this study, involves the use of light nordic ski equipment and techniques on prepared (track-set) or groomed trails. It is typically a day use activity undertaken in scenic frontcountry areas in close proximity to an urban area or nearby resort. Equipment can be relatively inexpensive and requires only minor skill levels and fitness, although world-class athletes can and do participate in this sport. It is particularly well suited to families and people of all ages.

Model Attributes:

This is a complex model as many attributes are required within a relatively small geographic area. Cross Country Canada standards were used to define the attributes used in this model – based on the Federation Internationale de Ski (FIS) standards. A 1000 hectare grid was applied over the district to serve as a basis for calculating the slope and relief parameters. Slope is the primary consideration, as there needs to be quite specific proportions of flat and sloped terrain. The ideal is 1/3 flat, 1/3 downhill and 1/3 uphill – the latter on slopes that don't exceed 7 degrees. This variability of slopes should be captured within a relatively small geographic area (1000 hectares or less) so that trail loops can be created in increments (e.g. 5km, 10km, 15km). Overall relief should be less than 150 metres to avoid extreme climbs or long, steep descents. Features are added to embellish the model. Attractive scenery, lakes, wildlife viewing opportunities etc.; all add equally to the capability of an area.

Model Limitations:

As with many of the models that include "features" as a modifier, there is poor or inconsistent data on recreation features, with associated results on the outputs of the model. Scenery data is subjective and averaged over large polygons; wildlife data is poor or unavailable; and slope data is averaged so it does not take into account areas fragmented by cliffs or steep embankments. The starting point for the 1000 hectare grid was arbitrary. If the starting point was moved a short distance in any direction, then different results may be obtained.

Potential Model Improvements:

Moving the grid one or more times, running the model, and then averaging the results would produce a more accurate reflection of capability. However, this is more costly and time consuming and the results may only be marginally better. Higher level FIS standards (e.g. greater length of sustained climbs, degree of slope) could be applied in the model. This would result in more rugged terrain being selected that would cater to more advanced levels of skiers.

4.4 Snowmobiling

Product Description:

Snowmobiling is a winter activity utilizing motorized over-snow vehicles for recreational purposes. In this study, the "alpine" snowmobiling- adventure experience is the one that is modelled, as this is the type of product that the project Steering Committee felt has the greatest potential for commercial development. However, there is also potential to model for a trail-based snowmobiling-holiday experience that utilizes more subdued terrain on existing or improved trail networks between destinations that may be days apart. This latter experience is more family-oriented whereas the former caters more to adventuresome individuals seeking an adrenaline rush.

Model Attributes:

In this model, the alpine tundra (AT) biogeoclimatic zone is the principal attraction, therefore, biogeoclimatic data is the primary screen. Unlike other winter activity models, the upper ESSF is not a preferable area for snowmobilers as these represent one of the most important sites for caribou and manoeuvering through trees at speed on snowmobiles can be problematic.

Slopes are the next consideration. Slopes over 25 degrees represent an extremely high potential hazard from avalanches or other mishap. It is recognized that some very steep slopes and "hammer-heading" possibilities are attractants for extreme snowmobilers, but these are not generally requirements or even desirable characteristics for commercial snowmobiling operations where liability is a major consideration.

Features such as attractive scenery, cabins, trails, ice-fishing, historical features, etc. can enhance the snowmobiling experience and raise the overall capability in the model.

Model Limitations:

The focus of this model is snowmobiling in alpine landscapes. These are deemed to be the most desirable destinations and therefore, inherently, are thought to have the highest capability. However, given a different focus - such as long distance point to point riding on well-groomed trails, different attributes would be utilized and the results of the model would be substantially different. Lack of feature data or reliability is a limitation. The model also eliminates slopes over 25 degrees which may still have capability for snowmobiling. It is noteworthy that areas of high capability (i.e. <25°) may still be areas prone to avalanche hazards.

Potential Model Improvements:

Improved availability and quality of the feature data would enhance the model. A second model that focuses on trail oriented snowmobile riding as a specific activity would also be useful.

4.5 Heli-Hiking

Product Description:

Heli-hiking involves being flown by helicopter into remote alpine terrain, being dropped off to hike for relatively short distances (usually 10 km or less), and then being picked up again by helicopter and returned to a base which may be a lodge, resort or other form of accommodation. This is almost exclusively a day-use experience, although it may be part of a multi-day holiday or resort experience, and usually caters to affluent clientele where fitness is not a major consideration. It may be guided or unguided.

Model Attributes:

The alpine tundra (AT) is the exclusive product being sold in this experience, and is therefore the primary screen in the model. Notwithstanding the fact that highly variable slopes can be expected in the alpine, lesser slopes are preferred and steeper ones are generally avoided. Slope categories within the alpine zone, therefore, largely determine the level of capability for this activity. Features such as wildlife viewing, attractive scenery, waterfalls, lakes and icefields can modify this level.

Model Limitations:

Feature data is limited or inconsistent. The model focuses exclusively on the alpine tundra therefore spectacular areas that may exist in other biogeoclimatic zones, are excluded from the model. The model may exclude knife-edge mountain ridges due to the apparent steepness of slope though the actual ridge itself may be in an appropriate slope class.

Potential Model Improvements:

Improved feature data would improve the quality of the model. Views of highly modified terrain, such as clear cuts, are less desirable. This information is available in the TRI data, but is considered unreliable as it is averaged over large landscape units at the 1:250,000 scale. The information results in unrepresentative polygons when applied at the 1:50,000 scale. If reliable "scenery" information was available, it would greatly enhance the model

4.6 Horse-Packing

Product Description:

Horse packing involves trail riding on horses either for day use or for multi-day trips. Day use is usually based from a lodge, resort or guest ranch, ideally in an attractive natural setting where the operation of a ranch is feasible, and where there is easy accessibility to a network of trails.

Multi-day trips usually require wilderness or near wilderness settings, and cabins or camps to accommodate guests. Accessibility to trails is required and alpine or sub-alpine zones are a preferred destination if possible. However, steep, rocky or boggy areas are considered as undesirable for commercial ventures because they are dangerous and can create too much liability for operators.

Model Attributes:

Trails are the key ingredient for the viability of any horse-packing operation, and therefore trails (and roads) are the primary screen. Good trails or narrow gravel roads are preferred, as these provide ideal footing for the horses, yet provide the rider with a sense of being part of the surroundings. Wider roads serve mainly as access to narrower ones or trails. Slopes are the next major consideration, as steeper slopes quickly become awkward for horse and rider, and introduce the unsavory possibility of accidents and associated liability. Features such as attractive scenery, cabins, waterfalls, lakes etc. can enhance the experience. Alpine areas, if accessible, are a considerable attractant, and are weighted more heavily in the model.

Model Limitations:

As with many of the models, feature information is either lacking or unreliable. Trails, if well built, can switch-back up slopes that may be greater than 20 degrees. However, slopes over 20 degrees are eliminated from the model as information on suitability of trails for horses is unavailable.

Views of highly modified terrain, such as clear cuts, are less desirable – but are not captured in the model. This information is available in the TRI data, but is considered unreliable as it is averaged over large landscape units at the 1:250,000 scale. The information results in unrepresentative polygons when applied at the 1:50,000 scale.

The model selects trails and single lane gravel roads as a prerequisite. However, unless these trails have been maintained or "improved", they may not be passable and thus unusable for horse packing. Many horse packing trails that are used by guide outfitters are missing in the trail inventory database. Conversely, the back alleyways of Prince George are identified as having some capability for horse packing. This is due to the issue of generalized coding of all gravel roads in the database.

Potential Model Improvements:

The focus of the model is on trails or single lane roads as the starting point. However, the focus could be on the destination of the horse trip such as alpine landscapes. This would give very different model results. As with the other models, improved trail inventory and feature data could enhance the quality of the model results.

4.7 Llama–Packing / Backpacking

Product Description:

Backpacking is essentially an extended hiking trip where the participant must carry all personal gear, is required to camp-out, and is travelling in remote or semi-remote terrain for up to several days at a time. Qualified guides or intermediate to advanced outdoor (orienteering) skills are normally required.

Llama-packing is basically the same product, except that Llamas are used as "the beasts of burden". Participants walk or hike with the animals carrying the majority of the heavy gear. Llamas are very sure-footed, and can access most areas that a hiker is willing to go. There is also some novelty associated with the animals and this can be an attractant in itself, although the prime motivation for participants is a wilderness experience in scenic remote terrain. Operators offer both moving trips (move each day) or day trips from a base camp.

Model Attributes:

Llama-packing/Backpacking requires a high quality wilderness setting with a strong sense of isolation and attractive scenery. Alpine and sub-alpine environments are particularly favoured and biogeoclimatic zones, therefore, are the primary screen in the model.

The availability of trails is an important consideration in treed biogeoclimatic zones. A high quality outdoor hiking experience without trails is next to impossible in the Prince George District. In the alpine zone, however, slope becomes a limiting factor as steep slopes can often have dire consequences for mishaps.

Features such as fishing, lakes, waterfalls, cabins, wildlife viewing opportunities, historical features etc. can enhance the experience. Their absence can also detract from the experience and therefore the model takes both into account.

Model Limitations:

Feature data is either absent or unreliable for much of the district. Trail data is also unreliable as the data contains many coding errors. For example, some parts of the same trail are coded as 'trail', and

other parts are coded as 'single lane – gravel', while still others may not be coded at all leaving blanks or gaps in the model.

Many trails that are used by guide-outfitters are missing in the trail inventory database.

Potential Model Improvements:

The trail inventory data needs to be updated. There are a number of known trails that do not show up on the base maps. As with other models, improved quality of the feature data would enhance the reliability of the model. The model depicts all AT and ESSFw as being high capability. Without more specific data (such as trails or features) the ESSFw may not, in reality, possess high capability for this activity. In future, the model should probably ascribe high capability only to the alpine (AT) unless there are additional features.

The slope classes could be varied and this would, in turn, vary the capability classes of the landscape. This might be a consideration to identify terrain suitable for backpackers of different levels of ability.

4.8 Lake Paddling

Product Description:

Lake paddling involves self-propelled (non-motorized) transportation around lakes, usually by canoe or kayak on a day-use basis, or multi-day tripping across several lakes with portages required in between. Since the lakes are typically quite small, and there are very few lake-chains in the Prince George District, this activity is currently associated with recreational paddling around local lakes. The activity does not require the same high level of technical skills or fitness as its river (whitewater) equivalent. It is suitable for a wide range of participants in both age and ability.

Model Attributes:

Larger lakes with variable shorelines, and attractive scenery with little sign of human presence are the primary attractants for this activity when considering a commercial enterprise. Generally, lakes that permit half-day to full day paddling and enable participants to achieve a sense of isolation (including being away from other participants) are required. Smaller lakes can also have potential, but would require the presence of additional features to enhance the experience. Such features include historical or cultural sites, wildlife viewing, sandy beaches, waterfalls, fishing, etc. A 1 kilometre buffer was added to each lake to capture features, and to capture lakes in close proximity to each other and thus, with a portage, make a multi-day experience.

Model Limitations:

Unavailable or inconsistent feature data is a limitation. Modified landscapes such as logged areas or housing/cottage developments that are a deterrent to participation, are not captured in the model.

Although selected in consultation with local operators, the size of the lakes was a subjective decision. By modifying the size, the capability of the lakes will change. Also, the model does not pick up lakes that may be joined to one another by rivers and streams that fall outside of the two-kilometer buffer.

Potential Model Improvements:

A different approach to determining capability might be to use a perimeter-to-surface area ratio. This would highlight lakes that have a variable and diverse shoreline with many bays, bends, points, and corners within the perimeter of the lake. Those lakes with a larger perimeter to area ratio, would have inherently higher capability. The assumption in this approach would be that it is more interesting to paddle a variable shoreline than a straight one.

4.9 ATV'ing (All Terrain Vehicle)

Product Description:

All terrain vehicle (ATV) riding involves the use of small three or four-wheeled motorized vehicles on logging roads, trails, or "off-road" terrain. ATV's are often used to facilitate access to remote locations for other purposes such as fishing, hunting, or sightseeing. Increasingly, ATV's are used by participants who enjoy the riding experience itself and who don't have an ulterior motive for riding. The activity is suitable for people of all ages and fitness levels although by far the largest category of participants is young males. ATV riding is distinct from 4X4 use which typically involves light trucks (possibly with modified suspension and larger tires) and which often compete for terrain with ATV's. 4X4's are much harder on the environment and tire tracks often create difficult driving conditions for ATV's.

Model Attributes:

Gravel roads and trails are the prerequisite for participation in this activity. Abandoned or little-used single lane logging roads are preferred. Trails are also used if they are "improved" through the removal of brush or major obstacles such as boulders or fallen-down trees.

Features such as fishing lakes, historical or cultural sites, gravel pits, cabins, good scenery etc., can enhance the experience.

Model Limitations:

Although trail riding on ATV's has the potential to be very high quality, there is no data on trails that are "improved". Without improvements, trails are deemed to be less desirable than single lane gravel roads. As in the horse packing model , coding limitations have identified the back lanes in downtown Prince George as "single-lane gravel" and therefore they show up as potential ATV terrain in the model.

The inherent assumption that single lane gravel roads provide for better riding may not necessarily apply to all participants and areas within the district. In fact, improved trails may provide for better riding experiences. Furthermore, the model does not pick up open terrain that may be very suitable and desirable for ATV riding.

The quality of the feature data is poor and thus may induce poor model results.

Potential Model Improvements:

Improved quality of the feature data and an updated, detailed road and trail inventory would enhance the model greatly.

4.10 Jet Boating

Product Description:

Jet boating involves river travel in high-powered shallow-draft boats with a jet-propulsion system (no propeller) that enables maneuvering in very shallow water. Jet boating is often used to support other activities such as hunting or fishing, but is increasingly used as a "touring" activity that is enjoyed for the ride itself as well as sights and activities along the way. Boats are typically quite small (18-23 feet) and can accommodate 6-12 passengers. Smaller winding rivers with long navigable stretches (at least 15-20 km), and which provide a sense of isolation, are preferred. The activity is suitable for any age or level of fitness. Day use jet boating is most common, but multi-day trips are offered on specific rivers that permit navigation for long distances, and offer a variety of sights and ancillary activities.

Model Attributes:

Rivers that are navigable by jet boats are the prerequisite for participation in this activity. Jet boats can travel in very shallow water, but cannot navigate extremely rough rapids or waterfalls. Portaging is not an option, so participation for the purposes of this model is restricted to rivers classified as I and II water (International canoeing classification).

Features like wildlife viewing, attractive scenery, beaches, waterfalls and historical or cultural sites can enhance the experience considerably, and provide welcome diversion from the long hours of travel on the water.

Model Limitations:

The primary screen for the model is dependent upon data extracted from the Northwest Brigade's canoeing guide to the Prince George Region. While only Class I & II routes were selected, there is no data available on navigation for jet boats. There may be long stretches of Class I & II rivers, interrupted by very short stretches of rougher water or waterfalls. These are not an impediment to canoes that can be portaged readily. However, these impediments would negate the routes for use by jet boats.

The quality of the feature data is poor and thus the model results may not accurately reflect the actual capability for jet boating.

Potential Model Improvements:

A comprehensive river inventory from the perspective of what makes desirable jet boating, needs to be undertaken for the entire district. The canoeing river classification used in this model may not be appropriate for jet boating. Also, there needs to be a great improvement in the quality of the feature data including identification of boat launch locations.

5 CONSTRAINTS AND SUITABILITY FACTORS

Many areas may display the inherent capability to support a particular tourism product or activity, but unless that capability can be combined with avoidance of conflict with other uses, the area may not be suitable for commercial development. Constraints and suitability factors for the development of opportunities were identified in consultation with user groups, operators, and agencies. This section identifies the criteria that must be considered when evaluating the potential of a commercial recreation opportunity.

5.1 Heli-Skiing / Cat-skiing

Mechanized versus non-mechanized activities:

- Both heli-skiing and cat-skiing operators promote deep, untracked snow to their paying customers. Expectations for good snow conditions are high as clients often pay hundreds of dollars per day to participate in these activities. Exclusive use of winter terrain, therefore, is seen as a requirement by operators to satisfy their clientele. Other forms of mechanized use, particularly snowmobiling, are seen as incompatible with heli-skiing and cat-skiing. Cat skiing uses considerably less territory (30-80 sq. km) to operate a business than heli-skiing (700-3000 sq. km), and should pose fewer difficulties in separating it from other non-compatible mechanized uses.

Competition with other commercial and recreation activities:

- The need for guaranteed snow conditions usually means that any other form of commercial or recreational activity will have a negative impact on heli-skiing or cat-skiing. Self-propelled activities like ski touring or snow shoeing would have a lesser impact than snowmobiling or snowmobile-assisted skiing which is becoming more popular in some areas. A growing issue for operators is the marketing and promotion of backcountry recreation by communities in the hope of attracting the use of services (food, supplies, accommodation) in those communities as a by-product. This places additional demands on the backcountry for "recreational" use, but it is commercially motivated, and greatly increases the potential for conflicts for which the communities do not (currently) have to assume any responsibility.

Land Status and Tenure:

- Considering the large investment required to operate and maintain a heli-skiing or cat-skiing business, the ability to obtain a tenure with sufficient length and security is seen as a critical factor for success. Private land occupies a very small proportion of the district and almost none of the area with highest capability for heli-skiing and cat-skiing. Other tenures such as tree farm licenses and timber supply areas are not necessarily incompatible as long as there is good communication amongst the operators. Logging can actually assist skiing if certain slopes are cleared or gladed in aesthetically positive ways with high stumps and brush piles cleared away. Provincial Parks, Recreation Areas and wildlife management areas may have the effect of restricting heli-skiing or cat-skiing operations, depending on their compatibility with approved policies and plans.

Access:

- Accessibility is a critical factor in the success of these high capital and operating

cost businesses. Road access can substantially reduce operating costs. Proximity to major airports is another decided advantage. The secondary impact of logging - opening up road access to other users such as snowmobilers is seen as potentially being of great concern. Road deactivation and enforcement may be required. Since heli-skiing and cat-skiing require proximity to a base of operations, this model should be combined with some lodge location criteria to assist in the selection of the most suitable areas. Many areas that appear as having high or moderate capability, may be in areas that are prone to avalanches.

Wildlife:

- Goats and caribou are the two species of most concern to these activities. Both occupy habitat at high elevations in winter where these activities are most likely to occur. The greatest potential for impact is associated with the low flight path of helicopters in pick-up and drop-off areas. This need not be a major development constraint, but some areas where there are particular concentrations of animals may be subject to deferrals or permanent restrictions. Close consultation with BC Ministry of Environment, Lands and Parks (Wildlife Branch) will be required.

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5.2 Ski Touring

Mechanized versus non-mechanized activities:

- A pristine wilderness environment is a primary criterion for participants in this activity. Peace and solitude in a natural setting is an important part of their experience. The presence of mechanized transportation such as helicopters, snow-cats or snowmobiles is, therefore, usually incompatible with ski touring, unless it is for access or egress purposes. It is desirable to separate these uses geographically wherever possible.

Competition with other commercial and recreational activities:

- Because of relatively small spatial requirements, ski touring may be able to co-exist within heli-skiing areas if operators are willing to cooperate. It is also generally recognized that the presence of ski tourers does not significantly affect heli-skiing and cat-skiing operations. Snowmobiles, however, are generally viewed as having a negative impact on ski touring. Much of this view is based on differing attitudes on use and enjoyment of the natural environment. Ski touring clients tend to view the wilderness as a quiet place for contemplation where nature can be appreciated on its own terms. Mechanized uses such as snowmobiling tend to cater to those seeking thrills and an adrenaline rush. Although the distinction is probably more founded in perception than reality, it nonetheless has a significant affect on the ability of users to coexist. Establishment of commercial ski touring operations can dramatically increase the intensity of use on preferred terrain that is easily accessible from local communities. Since exclusive or low-density use is highly valued, local recreation conflicts can occur.

Land status and tenure:

- Other winter commercial tenures can have a negative impact on the amount of terrain available to initiate a ski touring business. Forest tenures are also problematic for ski touring as the activity relies heavily on unmodified landscapes as a principal attractant. Although most ski touring activity takes place in the alpine and subalpine zones where forestry values are minimal, visually altered landscapes are visible for miles and negatively affect the experience. Privately owned land is not a major issue in the district.

Access:

- Road access to within a reasonable distance is a critical factor in the success of a ski touring business. Clients may be flown by helicopter to the lodge or cabin that serves as a base of operation, but a 15-20 minute round trip is generally seen as a limit for commercial viability. The availability of good hut or cabin locations is also an important criterion when considering the suitability of areas. Many areas that appear as having high or moderate capability, may be in areas that are prone to avalanches.

Wildlife:

- The small numbers of participants who move slowly on skis limits impacts on wildlife. Skiers should, nonetheless, refrain from approaching wildlife and causing them any distress. Facilities such as cabins should be located away from important wildlife areas. Likewise, helicopters being utilized for transporting clients should be routed away from wildlife use areas.

5.3 Nordic Skiing

Socio-economic factors:

- The most significant constraints to the development of a commercially viable nordic skiing centre are related to socio-economic factors rather than the physical characteristics of the landscape. Given adequate financial resources, the landscape can be modified as necessary to accommodate the required terrain characteristics for a quality nordic skiing centre. Other socio-economic factors of concern include the proximity to urban centres with adequate population base to support a nordic centre, the quality of the amenities and services provided at the nordic centre, marketing, etc.

Access:

- If the potential development site is not serviced within a reasonable distance from an existing road, the costs associated with road construction and maintenance may dramatically reduce the suitability of the area.

Land status and tenure:

- Access to tenured land would be required in order to justify the economic costs of developing a nordic centre. With tenured land, non-compatible activities can be controlled and restricted (i.e. snowmobile use of trails). Given that a nordic centre should be located within a reasonable distance of its market - usually nearby towns or urban centres - the cost and availability of land may be a major issue (e.g. if private lands needed to be purchased).

Mechanized versus non-mechanized activities:

- Mechanized vehicles (snowmobiles, ATV's) must be restricted from gaining access to developed track-set Nordic trails.

5.4 Snowmobiling

Mechanized versus non-mechanized activities:

- As mentioned under the skiing activities, snowmobiling tends to be the least compatible with other forms of winter recreation, particularly non-mechanized recreation, and therefore it should be geographically separated from other activities as much as possible. This may limit available terrain in higher elevation portions of the district that are the preferred destinations of other users. However, the southern and western portions provide excellent snowmobile trail networks suitable for multi-day trail riding, and where potential conflicts with other users are minimal.

Land status and tenure:

- The small amount of private land in the district should not pose a problem for commercial operations. However, land tenured for other commercial (winter) recreation will significantly diminish opportunities for new commercial snowmobile ventures. Forest tenures usually have the effect of opening up more roads and provide greater access for snowmobiles. Snowmobilers using roads with logging traffic can create safety problems.

Access:

- Snowmobilers will drive long distances to participate in their sport. Nevertheless, a ½ day drive or less is preferred to a plowed trailhead where trucks and trailers can be safely left. Plowed access to unplowed roads and trails is critical to participation. The shortest possible access to an alpine destination is required for commercial viability, to keep operating costs to a minimum. Deactivated roads may restrict access. Many areas that appear as having high or moderate capability, may be in areas that are prone to avalanches.

Wildlife:

- Wildlife constraints to snowmobiling in the Prince George District are potentially serious for winter range areas of caribou and mountain goats. Moose are also frequently encountered and commercial operations should be separated from sensitive wildlife areas.

5.5 Heli-hiking

Mechanized versus non-mechanized activities:

- A major constraint for this activity is the intense desire from other backcountry users, particularly backpackers and mountaineers, not to see or be "invaded" by mechanized forms of transportation. Intense lobbying from local hiking clubs has prompted the creation of a number of "deferral areas" where mechanized access is restricted. A public planning process will need to be

concluded to resolve this issue. Improved technology (ATV's) is also permitting access to remote areas that previously were the exclusive domain of the hiker. The irony is that once heli-hikers get to their destination, they don't want to see other users or modified landscapes. They want a temporary wilderness experience. A premium is placed on wilderness and lack of human presence.

Land status and tenure:

- Visual quality is a critical commodity for this activity, so forest tenures with active logging are a major constraint. Parks and protected areas may not permit this form of commercial activity although the terrain may have high capability. As with heli-skiing, the challenge of obtaining a tenure with sufficient length and security to justify the investment is considerable. This activity may best be performed as a summer supplement to a winter heli-skiing operation.

Access:

- Heli-hiking demands ready access to remote and spectacular landscapes within a few minutes (<15 min.) flying time from a base of operations. It is, therefore, generally associated with an existing resort or heli-ski operation. With the aging and relatively affluent baby-boomer market, this is thought to be one of the fastest growing potential activities catering to softer forms of wilderness adventure.

Wildlife:

- The greatest constraint is associated with low-level flying over sensitive wildlife areas. Avoiding such areas, particularly during pick-up and drop-off can generally mitigate this. Terrain impact in sensitive alpine environments is also a potential concern if areas are frequented by clients on a regular basis. Some areas with capability may be unsuitable due to the presence of bugs that make the hiking experience unpleasant.

Seasonality:

- As with other activities that rely upon alpine environments, the snow-free season is short and the associated window for business is restricted to July, August and September.

5.6 Horse Packing

Mechanized versus non-mechanized activities:

- Horse packing is typically a multi-day "wilderness experience" for visitors on horseback. It generally requires access to large tracts of crown land where some trail development has taken place. Contact with other users, especially those using mechanized transportation, is seen as undesirable. Day use trail riding is more compatible with multi-use trails, as this product is not so highly associated with wilderness.

Land status and tenure:

- Forest tenures can have a major impact on areas where trails have been developed for horse packing. Clients do not expect to see major human alteration of the landscape, especially logging. The acquisition of some form of tenure over trail development and use areas would allow operators to maintain some control over the environment and associated viewscapes. Parks and protected areas may have policies that preclude the use of horses, especially in sensitive areas such as alpine environments and riparian zones which are often scenic and are, therefore, desirable destinations for horse packing.

Wildlife:

- Slow moving pack trains and low numbers of participants limit the potential impacts on wildlife. Very sensitive areas should be avoided, and participants should maintain a discrete distance from any wildlife that is encountered. Terrain impacts in wet areas is a common concern.

Access:

- Horse packing is very reliant on road access to trailheads and trails that lead to wilderness destinations. Circuit routes are preferred over out-and-back trails.

5.7 Llama Packing / Backpacking

Mechanized versus Non-Mechanized Activities:

- Clients on commercially led trips prefer not to hear or see other mechanized vehicles. Preference is for remote pristine appearing environments separate from other areas where mechanized use is permissible.

Wildlife:

- Often the presence of wildlife is a major attractant for this activity. The majority of wildlife issues can be managed through appropriate behavior, temporal and spatial closures and restrictions. Depending on area and amount of use, restrictions such as designated trails to minimize impacts on mountain caribou and other species may be required.

Access:

- An important constraint for this activity is the presence or absence of vehicular access to trailhead areas. Without access, the highest capability areas cannot be utilized. Trailhead has to be accessible within a ½ to 2 day's hike from where the vehicles must be parked.

Seasonality:

- Many of the preferred (alpine) destinations for this activity often have a very short snow-free season (late June/early July to late September); thus the commercially viable season is small.

Land status and tenure:

- Some areas with high capability for Llama packing / backpacking are within protected areas such as provincial parks. Such areas may or may not accommodate commercial backcountry recreation depending on management plans and policies.

Within the areas administered by the Ministry of Forests, often there is a competing use for the land base between logging and recreational use. Since natural landscapes with little alteration are preferred, active logging and clearcuts can be a major constraint for this activity.

5.8 Lake Paddling

Mechanized versus non-mechanized activities:

- Separation of mechanized watercraft from non-mechanized watercraft is an important constraint. Clients on commercially led lake paddling trips are looking for a sense of isolation and wilderness. Typically, they do not want to hear or see other motorized watercraft. Larger lakes that provide the best opportunities for lake paddling trips also tend to attract powerboats.

Access:

- The single most important consideration for commercial lake paddling operation is access to high capability lake paddling areas. Either road access or fly-in access to a high capability series of lakes is necessary. Areas where the roads come within a two-kilometre radius of a lake, but do not provide direct access, are preferred since this will usually prevent motorized watercraft from using the area. A series of lakes accessible to one another via portages or connecting waterways (rivers, streams) is preferred over single isolated large lakes. Lakes connected in such a manner may provide opportunities for multi-day wilderness paddling trips.

Land status and tenure:

- The presence or absence of tenure is not a major issue unless public access to lakes is restricted. Then either specific tenure for access to the lake is required, or tenure for access to specific areas of the shoreline for camping and picnicking purposes is required. Less modified landscapes are preferred to highly modified landscapes. Parks and protected areas are often associated with high quality lake paddling opportunities. However, specific management policies may restrict commercial operations. In some locales, paddlers wishing to fish as part of their experience may come into conflict with guided fishing outfitters.

Wildlife:

- As with other models, the presence of wildlife is a major attractant for this activity. The majority of wildlife issues can be managed through appropriate behavior, temporal and spatial closures and restrictions. Depending on area and amount of use, restrictions such as designated routes to minimize impacts on vulnerable species may be required.

Visual Aesthetics:

- Some areas that provide capability for lake paddling are within areas where the viewscape has been degraded due to logging, mining, cottage development and other forms of human alteration of the landscape. This is a major deterrent to this activity.

5.9 ATV'ing

Mechanized versus non-mechanized activities:

- ATV'ers are not looking for an exclusive wilderness experience and therefore do not mind sharing the trails with other users, whether mechanized or not. The non-mechanized user may not necessarily reciprocate the same tolerance.

Competition with other commercial and recreational activities:

- ATV's use the same logging roads and trails that would be used by hikers, trail riders, mountain bikers, and 4X4's. As noted above, although there is some tolerance of these other activities, it may not be reciprocated, especially if the type of use is inconsiderate of others. If there are existing commercial operators in the area, this could lead to conflicts. Separation of ATV's from other commercial activities is desirable.

Land status and tenure:

- Forest tenures are not a major constraint. In fact, logging tends to create new access roads for potential ATV use. Parks and protected areas commonly restrict ATV use as an incompatible activity.

Access:

- Access is probably the greatest constraint for this activity since, in the Price George District, it requires the use of trails and logging roads for participation. If logging roads are deactivated or if trails are not suitably improved or maintained, then ATV'ing is not possible.

Wildlife:

- ATV's should be separated from sensitive wildlife areas and alpine zones where there is potential for significant terrain disturbance.

5.10 Jet Boating

Mechanized versus non-mechanized activities:

- This is not an issue from the perspective of jet boaters, but may be so from the perspective of other users of the waterways. Jet boaters may have to limit use to minimize noise and frequency of disturbance. Jet boating can provide access into high quality fishing and hunting territory that would otherwise be difficult to access. Personal watercraft (PWCs) can access many shallow river courses.

The rental of PWC's is a potential area for growth in commercial centres located along rivers and lakes.

Land status and tenure:

- Commercial jet boating may require foreshore leases or licenses of occupation to accommodate use of picnic sites, overnight campsites and/or cabins (or other roofed structures). Certain areas with capability for jet boating are in areas where First Nations have fishing rights (i.e. placement of fishing nets across river course). Some areas with capability for commercial jet boating are also areas where people have built homes along the river. The noise and frequency of commercial jet boat use may be an issue of concern for these residents. Commercial jet boating can provide access to areas of high quality hunting and fishing and thus, in essence, act as a guide for these activities - though they are not licensed for them. This could lead to conflicts with licensed fishing and hunting guides.

Access:

- A significant constraint for commercial jet boating is the quantity and quality of roads that provide access to rivers with capability for jet boating. Also, many areas with capability for commercial jet boating do not have adequate access to the river for launching of boats. In those few areas where access is available, the parking of vehicles is often crowded with commercial and non-commercial users. Safe and secure parking for clients is often a problem for the commercial jet boater.

Wildlife:

- Jet boats should likely be separated from sensitive wildlife areas, especially at times when there is potential for significant disturbance, such as during waterfowl nesting periods.

Visual Aesthetics:

- Some areas that provide capability for jet boating are within areas where the viewscape has been degraded due to logging, mining and other forms of human development and alteration of the landscape. If the qualities of the special features that enhance the capability of a river for commercial jet boating are degraded, this in turn will reduce the suitability of the river for commercial jet boating.

5.11 Native land Claims

It is worth mentioning that a major caveat for all potential commercial and private recreational activities is the ongoing process of native land claims in the province. First Nations may be given exclusive rights over large territories in the province and would thus have direct control over the type and amount of commercial activities that would be permissible.

6 TOURISM AND COMMERCIAL RECREATION OPPORTUNITIES

This section identifies and summaries the opportunities for commercial recreation development. Each of the ten activities has been modeled and mapped for commercial recreation development at both the 1:50,000 and 1:250,000 scale.

The focus of this section will be a discussion of the high capability areas for each activity as discernable from the 1:250,000 scale maps of the district. Wherever possible, the high capability areas will be described in recognizable geographic units.

6.1 Heli-Skiing / Cat-skiing

The eastern and southeastern portions of the district have the majority of the areas with capability for heli-skiing. Of particular note, glacier areas and high elevation northerly aspects stand out as having high capability. The capability for this activity generally tapers off from south to north along the Rocky Mountains throughout the district.

Kakwa Area

The large contiguous mountain block centred around Mt. Sir Alexander, Kisano Mountain and Koona Mountain stands out as the largest high capability area for heli-cat skiing throughout the district. This is largely due to the high proportion of high elevation glaciated terrain, and abundance of long slopes with northerly aspects. If the Pearson Peak and Nechamus Mountain area are added to this block, it might comprise a large enough area for a viable heli-skiing operation. This appears to be the only area large enough to sustain a heli-ski operation within the district.

Much of this area falls within the soon to be designated Kakwa Provincial Park and thus may not be suitable for the activities of heli and cat-skiing. The planning process for this park will determine the acceptability of heli and cat-skiing within the new park. Though this block has a large contiguous area of high capability terrain, it is currently remote both from any helicopter base of operations, and from winter-accessible roads.

The Kakwa area also has high capability for ski touring and snowmobiling, and thus presents potential conflicts amongst these diverse user groups.

Due to its smaller demands on space, there are numerous areas of high capability cat- skiing terrain elsewhere throughout the district. These include the Ice Mountain area; Vreeland Glacier Area; Dome/Dog Mountain Area in the north Cariboos; the Walker Creek Area; and the high ridges on either side of the McGregor River. These areas warrant more detailed investigation.

6.2 Ski Touring

The eastern mountainous portion of the district is the area that presents the greatest capability for ski touring. Generally speaking, high elevation, north-facing terrain tends to comprise the areas of high capability, while southerly aspects tend to possess moderate to low capability.

Mt. Sir Alexander Area

This is a large contiguous area of high capability for ski touring that incorporates five mountain peaks: Mount Sir Alexander; Kitchi Mountain; Dorsal Mountain; Pommell Mountain; and Obelisk Peak. Some of these peaks fall within the proposed Kakwa Provincial Park. This block has good potential for the development of a high elevation hut-to-hut operation. Also, much of this block appears to have viewscapes that have not been modified by human disturbance. Just to the north, there are four other sizable areas of high capability centered around Kisano Mountain, Koona Mountain, Pearson Peak, and Nechamus Mountain. All of these areas also appear to have terrain that could sustain a commercial backcountry ski touring operation. It should be noted that this entire area also has high capability for heli-skiing, cat-skiing and snowmobiling, and thus potential conflicts amongst these diverse user groups are possible.

The following areas are also worthy of further exploration for their ski touring potential because they appear to have large enough areas of high capability terrain, and are reasonably accessible from the Highway 16 corridor. They include Walker Creek area; the Northern Cariboo Mountains especially along Everett and Dome Creek drainages; and the mountain ridge between the McGregor and Herrick Rivers (Mt. Hedrick Area). There are numerous other small pockets of potential ski touring terrain along the great divide running north to south throughout the district.

6.3 Nordic Skiing

The western half of the district, and in particular the southwest portion, with its associated lower elevations and relief, is where the predominance of nordic ski capability occurs. This area offers the best choices for nordic skiing development. A high proportion of all terrain that has nordic skiing capability falls within the high and moderate categories, suggesting that the appropriate terrain characteristics are widespread in the western part of the district.

Chilako River Basin - Highway 97 Corridor South

Of particular note is the abundance of high capability terrain south and south west of the city of Prince George along the Chilako River and Highway 97 corridor. This area is well serviced by a network of roads and is close to the major population centre in the district. Much of the area has been logged however, which has an impact on natural viewscapes and there is some private land that may preclude development for nordic skiing or make it expensive to acquire.

Highway 97 Corridor North

North of Prince George, the moderate and high capability areas are more evenly scattered along the Highway 97 corridor, and there are not as many access roads to facilitate development. This area is also more distant from the major market centre of Prince George.

6.4 Snowmobiling

The eastern mountainous portion of the district contains almost all of the high capability terrain for snowmobiling. It is noteworthy, however, that extremely steep slopes border much of this terrain and may negate access or make it extremely difficult. In the flatter western portions of the district,

there are almost limitless snowmobiling opportunities but these are identified as having low capability (due to the alpine focus of the model), with some moderate capability along selected trails.

Eastern Mountainous Areas

As one progresses from west to east through the front ranges of the Rockies, there is increasingly more high capability terrain, but distance from paved access becomes proportionately greater and access more difficult. Within this broad area, Kakwa

Recreation Area has the greatest proportion of high and moderate capability, though access to snowmobiles may or may not be restricted in the future due to impending park status. Bear Paw Ridge to the north and Sugar Bowl Mountain to the south of Highway 16 have a particular advantage for snowmobiling due to their proximity to a major highway.

The eastern portion of the district also has high capability for ski touring, heli-skiing and cat-skiing, and thus potential conflicts amongst these diverse user groups may occur.

Mt. Tabor – Mt. George – Naver Creek Area

A noteworthy area for snowmobiling is the ridge from Mt. Tabor south through Mt. George to Naver Creek. This area has moderate to high capability with an extensive trail network. This area has easy access from Prince George and is adjacent to popular trails that connect Prince George to Barkerville.

6.5 Heli-Hiking

Overall, the district has abundant potential to support heli-hiking. The high capability areas for heli-hiking are in the east and northeast portion of the district, in the heights of land and ridges surrounding the McGregor, Herrick and Torpy River drainages trending NW/SE along the continental divide. Much of the high alpine areas that have high capability for heli-hiking also have high capability for Llama packing/backpacking and horse packing. This could lead to conflicts amongst mechanized versus non-mechanized users.

McGregor River – Kakwa Area

McGregor River flows out of the Kakwa Provincial Recreation Area that is slated to become a Class A Provincial Park. While this will provide some assurance against landscape alteration, heli-hiking may not be permissible under the park management plan.

Herrick River Drainage

The Herrick drainage has a lot of high capability terrain, but it is further from bases of operations along the Yellowhead Highway.

Torpy River Area

The Front ranges of the Rockies along the Torpy River also have some good potential for heli-hiking, but may be constrained by views into modified landscapes and clear-cuts.

6.6 Horse-Packing

Due to the vast network of logging roads and trails in the district, horse packing is possible almost anywhere. However, in terms of wilderness-oriented multi-day horse packing opportunities, a number of areas do stand out.

Sugar Bowl Mountain south to Pinkerton Peak and east to Everett Creek

This area contains high capability trails in alpine settings, and loop multi-day opportunities. Hikers also frequent the area and minor conflict potential exists.

McGregor Valley – Kakwa Corridor

This is a multi-day linear route following the McGregor River up to Kakwa Lake. Due to park status, viewsheds in the upper reaches are of unmodified natural landscapes with extensive alpine meadows through which to ride. The area is also a popular summer destination for other users and some separation of activities may be required to prevent environmental or social impacts.

Upper Parsnip River

The upper Parsnip River provides high capability for horse packing with spectacular mountain views and abundant wildlife viewing opportunities. The area is in a hunting / outfitting territory and also presents potential for commercial/private recreation conflicts.

Anzac River - Table River - Crocker Creek Area

This area provides multi-day loop and linear horse packing opportunities in rugged wilderness mountainous terrain with good wildlife viewing opportunities.

In addition, there are some other shorter routes (2-3 days) that access alpine terrain. Examples are Dome Mountain, Dog Mountain, Ptarmigan Creek in the northern Cariboo Mountains, and Fang Mountain and Torpy Mountain in the front ranges of the Rocky Mountains. All these areas require investigation into potential conflicts with other users.

6.7 Llama Packing / Backpacking

The entire mountainous eastern portion of the district possesses areas of high capability for Llama packing / backpacking. The areas on either side of the Highway 16 corridor, are the easiest to access. Scattered elsewhere throughout the district, there are a number of trails of moderate to low capability (Note: at the 1:250,000 scale, these trails are difficult to discern). There is little distinction possible between the high capability areas. The following general areas provide some context for discussion.

Rocky Mountains

The higher elevations of the Rocky Mountains provide the largest contiguous block of high capability terrain for this activity. In general terms, the greater the distance from Prince George, the more natural the landscape will be. The Kakwa area is already regionally known as an outstanding

area of high capability for Llama packing and backpacking. More detailed investigation is require to select specific areas most suitable for this activity.

Cariboo Mountains

The higher elevations of the Cariboo Mountains is the second largest contiguous area of high capability for Llama packing / backpacking in the district. This block is split into thirds by the Bowron and Willow Rivers, with the majority of the area being in the eastern third. Large areas in the western two thirds of this block may have been previously logged. There is abundant terrain with high capability, but as noted above, more detailed investigation is required to identify specific areas suitable for commercial Llama packing and backpacking.

6.8 Lake Paddling

In general, there is not a great abundance of high quality, multi-day lake paddling opportunities in the Prince George District. There are few large lakes, and those that exist are located in the lower elevation portions in the north west of the district. There are no significant lake paddling opportunities in the scenic mountainous portion of the district.

Carp Lake, McLoed Lake and Summit Lake

These three lakes are the largest in the district, and present the highest potential for extended commercial lake paddling trips. Immediately adjacent to the west of Carp Lake are several smaller lakes of moderate capability that might be combined with Carp Lake into a quality circuit route. Carp Lake is in a Provincial Park and is easily accessible by gravel road from Highway 97. However, as a park, there may be competition with the public for preferred camping sites. McLoed Lake and Summit Lake also have high capability, and are even more accessible as they are immediately adjacent to Highway 97. Easy access can also be a deterrent as human development and other recreational interests such as power boats may be attracted to these lakes and create an associated loss of wilderness experience for the lake paddler.

6.9 ATV'ing

ATV'ing is possible throughout the district except in the mountainous portions of the northeast. This is largely due to the large number of logged areas and the associated logging roads that provide the main attribute for this activity. The southern portion of the district in particular has a vast network of roads and trails that have ATV capability. Since this is largely a day-use activity, access to long distance trails and remote wilderness is not a priority.

Upper Salmon River Area

The upper reaches of the Salmon River in the western part of the district appear to have a number of roads and trails with high capability. However, these are largely unconnected segments and may or may not provide much opportunity for loop trips that are preferred over out and back trails. There are, however, features such as lakes and wildlife viewing opportunities that enhance the capability of this area.

Tabor Mountain Area

The Tabor Mountain area of the district has low or moderate capability according to the model, but it may have great potential for commercial ATV development due to the extensive network and connectivity of the trails in close proximity to Prince George.

Bowron River – Slim Creek Highway 16 Triangle

This area possesses a lot of roads and trails with moderate and low capability, but again, due to the high connectivity and good potential for loop trips there may be commercial development opportunities.

Chuchinka Creek to Parsnip River and McGregor River Areas

These two areas present some of the few high capability terrain areas for ATV's where there is potential for multi-day trips in relatively remote terrain with mountain views.

6.10 Jet-Boating

Overall, the district has a moderate potential for jet boating. There are some rivers with moderate capability that have sections of high capability such as the Parsnip River and the Herrick River. Other rivers with sections of moderate capability include the Torpy River, Nechako River, the Fraser River between Red Rock and Hixon, and the Crooked River.

Parsnip River

Of all rivers in the district, the Parsnip appears to have the greatest potential for a multi-day wilderness jet boating opportunity. The upper reaches of the river are still relatively unaltered and there is good potential for wildlife viewing.

Herrick River and Lower reaches of the McGregor River to the Fraser River confluence.

The upper reaches of the Herrick River have high capability for jet boating with moderate and low capability as one progresses downstream. The lower reaches are more likely to possess modified terrain, however, since the Herrick River is linked to the Fraser River, there are opportunities to blend the jet boating experience with other opportunities such as visiting historic or cultural sites. This river has multi-day potential as participants could board the jet boat in any of several locations including the city of Prince George.

Nechako River, Fraser River (south of Prince George), Torpy River and Crooked River

These are the rivers in the district that appear to have good commercial day-use jet boating potential. The Fraser and Nechako Rivers can be accessed from downtown Prince George and offer low to moderate capability. The Crooked River, which can be accessed from Highway 97 north, also possess moderate potential for commercial day-use jet boating trips, as does the Torpy River which can be accessed from either its upper or lower reaches. The Crooked River has nesting waterfowl in the spring and should be avoided at critical times.

7 SUMMARY AND CONCLUSIONS

There are several major issues related to the modelling processes used in this project. These will be summarized below.

Quality and Availability of Data

Perhaps the greatest problem encountered throughout the study, was the general lack of data. A close second was the lack of accuracy of data. There are a large number of roads and trails that are not inventoried in any of the available data bases. Some are picked up in some data sets and not in others. Since roads and trails are important features in many of the models, and a prime attribute in others, the accuracy of some of the model outputs was sometimes less than desirable. This same issue applies to the quality and availability of the features data. At best, it is sparsely inventoried throughout the district, and the level of detail and accuracy is occasionally poor.

Variable Data Sets

The digitization and referencing of specific features such as trails often varied from one data set to another. This resulted in single features sometimes being depicted in two slightly different geographic locations on the output maps (e.g. two trails appear to parallel one another when in reality they are the same trail). This can be resolved with a thorough re-examination and cleaning of all data sets.

Ground Truth Map Results

The capability map products of this report are as accurate as the available data. Since we know that sometimes the accuracy of the data is questionable, the interpretation of the final map products must take this into consideration. Before individuals or agencies invest considerable time, money and resources in proceeding with any specific commercial recreation product development as a result of the findings of this study, addition research is required to ground truth the suggested product/activity capability results.

Capability versus Feasibility

The focus of this study has been on commercial recreation *capability* of selected products / activities in the Prince George Forest District. Once an area has been determined to have capability for a recreation activity, additional analysis is required to determine if commercial development of the activity is feasible for the area. Issues such as relative location to markets, population centers, airports, highways, marketing, recreation and consumer trends, and so on should be examined. An area may have high capability for an activity, but the feasibility of the area to sustain the activity may be low.

Model Development

The capability models used in this study were developed with specific consideration to the local and regional conditions of the Prince George Forest District. If one were to apply these models elsewhere throughout British Columbia, the consistency of the map products for comparative analysis may be high, but the accuracy of the models to reflect local and regional conditions may be low.

Conclusion

The analysis of the capability maps developed in this study may have relevance when comparing activities at the landscape level scale (1:250,000). When viewed from the district perspective, this report and associated maps can be a useful tool to identify and market as yet untapped commercial recreation opportunities and to delineate and separate potential conflicts amongst often divergent recreational users groups. At the 1:50,000 scale, however, the maps should be used with a clear understanding of modelling limitations and in conjunction with other sources of information to help identify site specific opportunities.

The development of commercial recreation and tourism capability models and maps for the Prince George Forest District will, hopefully, be a good first step in assisting individuals, businesses and government agencies in identifying, planning, and managing commercial recreation opportunities. In this project, we have made a number of improvements to existing models and created several new ones. In future, with improvement in various data sets, inventories, and modelling techniques, further strides will be made towards the accuracy of model outputs. This will have an associated impact on their usefulness and reliability as decision-support tools.

APPENDIX 1: REFERENCES

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2. Prince George Region Tourism Opportunities Study (Phase 1:Tourism Inventory).
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3. Prince George Land and Resource Management Plan (Draft)

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4. Northeast Tourism Resource Inventory User's Manual

Prepared for Ministry of Small Business, Tourism and Culture, Victoria BC. Prepared by ARA Consulting Group Inc.& Timberline Forest Consultants, Vancouver BC.

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14. The Trail Development Resource Kit.

Cross Country Canada & Cross Country BC interpretation of Federation Internationale de Ski -- Standards for Nordic Skiing. Vernon, BC.

April, 1993.

APPENDIX 2 : LIST OF INDIVIDUALS AND GROUP CONTACTED

Workshop Participants
Contact Name: **George Evanoff** Business/Organization: Northern Rockies Ski Tours Mailing Address: 1960 Garden Drive Prince George, BC V2M 2V8 Phone: (250) 564-7814 Fax: (250) 564-7801 e-mail: nrst@mag-net.com website: www.northrock.bc.ca
Contact Name: **Dan Hunter** Business/Organization: Strider Adventures Mailing Address: RR1 Site 24 Comp 7 Prince George, BC V2N 2H8 Phone: (250)963-9542 Fax: (250) 963-8446 e-mail: strider@bcgroup.net
Contact Name: **Mark Aubrey** Business /Organization: Crescent Spur Heli-ski Mailing Address: General Delivery Crescent Spur, BC V0J 3E0 Phone: (250) 553-2300

Fax: (250) 553-2301 e-mail: regina@crescentspurheliski.com
Contact Name: **Norm Clarke** Business/Organization: Sons of Norway Mailing Address: 3955 Sunshine Cres. Prince George, BC V2N 5Y2 Phone: (250) 963-7417
Contact Name: **Garry Patterson** Business/Organization: Horseman=s Association Mailing Address: #801 1855 3rd Ave Prince George, BC Phone: (250) 962-5959
Contact Name: **Bob Orr** Business/Organization: PG Snowmobile Club Mailing Address: 734 Preston Road Prince George, BC V2K 1A8 Phone: (250) 563-5253
Contact Name: **Gary Enders** Business/Organization: PG Snowmobile Club Mailing Address: 1001 20th Ave. Prince George,BC V2L 5K2 Phone: (250) 964-4498
Contact Name: **Greg Redmond** Business/Organization: PG Snowmobile Club Mailing Address: RR2 Site 9 Comp. 28

	Prince George, BC
	V2N 2H9
Phone:	(250) 962-7810

Contact Name:	**Rick Brine**
Business/Organization:	Backwater Paddling(& NW Brigade Canoe Club)
Mailing Address:	7359 Imperial Cresent
	Prince George, BC
	V2N 2W7
Phone:	(250) 964-7400

Contact Name:	**Eric Griffith**
Business/Organization:	Jetboating(independent recreationalist)
Mailing Address:	2593 Ridgeview Drive
	Prince George, BC
	V2K 4C8
Phone: (250)	

Contact Name:	**Victor Bopp**
Business/Organization:	local naturalist and avid hiker
Mailing Address:	1677 Emmet
	Prince George, BC
Phone:	(250) 564-2635

Contact Name:	**Darrell Shrum**
Business/Organization:	Big Country Riding Stables
Mailing Address:	7040 Grave Road
	Prince George, BC
	V2N 6G1
Phone:	(250) 963-8113

APPENDIX 3: LIST OF DIGITAL FILES AND DATA BASES

Capability Maps - Digital files used to plot the capability maps are as follows:

TRIM:	double and single line water
	swamps/marshes
	contours
	roads/trails/railways
	pipelines/transmission lines
	annotation
Other:	Hall*data trails
	Prince George District boundary
	Provincial Parks/Ecological Reserves/Protection Areas
	Capability

Capability Coverages - Data sets used to create the capability coverages are as follows:

ATV:	TRIM single lane gravel roads (DA25000110, DA25000160), buffered 100m
	TRIM trails (DD31700000), buffered 100m
	MoF Recreation Features
Cat/Heli:	Biogeoclimatic Zones
	TRIM DEM points and breaklines
	TRIM glaciers
Heli Hiking:	Biogeoclimatic Zones
	TRIM DEM points and breaklines
	MoF Recreation Features
Horse Packing:	TRIM single lane gravel roads (DA25000110, DA25000160), buffered 100m
	TRIM double lane gravel roads (DA25000120, DA25000170), buffered 100m
	TRIM trails (DD31700000), buffered 100m
	Hall* trails, buffered 100m
	TRIM DEM points and breaklines
	MoF Recreation Features

Note: Hall* refers to the Economic Planning Group report – reference #2 in Appendix 1.

Jetboating:	Northwest Brigade Canoe Club - Canoe and Kayak Trip Guide document **(these data will not be made available digitally)**
	MoF Recreation Features
Lake Paddling:	TRIM double line water (GB15300000, GB15300130, GB15300140), buffered 1000m
	MoF Recreation Features
Llama Packing:	Biogeoclimatic Zones
	TRIM DEM points and breaklines
	MoF Recreation Features
Nordic Skiing:	TRIM DEM points and breaklines
	MoF Recreation Features
Ski Touring:	Biogeoclimatic Zones
	TRIM DEM points and breaklines
	TRIM glaciers
Snowmobiling:	Biogeoclimatic Zones
	TRIM DEM points and breaklines
	MoF Recreation Features